





CONTROL PANEL LX118

Control system with CANopen-Lift



Version: 1.2 2018-08-01



TECHNICAL DATA



CONTROL PANEL LX118

LX118 Apparatskåp	
Size (W x H x D):	600 x 1100 x 240mm
Power:	Main supply 3x 400V AC
System:	L1, L2, L3, N and PE

THOR NX-T Control system:

Operating system:	Linux platform 536 MHz Atmel Cortex A5			
Power Consumption:	Max 4,5W. Idle 1,5W			
CAN Bus:	2x CAN-open lift, galvanically isolated interfaces			
Interface: (DC	Ethernet, Micro SD-card, 2x USB Host, USB device, RS485			
Safety circuit inputs:	6 x 230V AC inputs, 5 x relay outputs 2A 230V			
Inputs: sumption	21 x 24VDC general purpose + 2 inputs for 30mA con- on. 2 x 230VAC for supervision (mains and car-light).			
Outputs:	8 x 24VDC 350mA, short circuit protected			
5 x	relay output, max 230VAC 5A.			
Safety zone:	4 x safety relays for door bridging.			
Battery:	Lithium 3V modell 2032			

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ENCLOSURE

CONNECTION: POWER SUPPLY



DANGER!

XXXX

1

* * * L1 L2 L3 N

Before working. Make sure that the installation is separated from the main supply voltage.

Main supply voltage

NOTE! With TN-C system (4-wire system) should the neutral (N) and the protective earth (PE) linked together. Check the connection.

Measure the voltage on the terminals from the mains, before you turn on the mainswitch Q01. Measure L1 to L2, L1 to L3, L2 to L3 (400VAC) and L1, L2, L3 to N and PE (230VAC)

CONNECTION: INVERTER



Power supply

Brake resistor Connet the shield tight to the GND

Motor Connect the shield tight to the GND

EMC-connection

- 1. Use only tight shielded cable for the motor and brake resistor.
- 2. Max length for the motor cable is 25 meters.
- 3. Connect the shield (360°) in both ends of the cables.
- 4. Keep distance between motor/brake resistor cables to the rest of the cables.
- 5. Provide brake, solenoids with varistors etc.

Motor connection

The motor cable must connect from the inverter to the motor U– U, V– V, W– W. If the motor turns in wrong direction, it must be changed in the inverters parameter.

Connection of the brake, brake contacts, thermistor and encoder, see the lifts circuit diagram.

BEFORE THE INSTALLATION DRIVE

Connect the contacts from the overspeed governor and the tension weight in the safty circuit.

Switch on.

- 1. Q02- for the car light and the socket supply.
- 2. Q01- main switch and the circuit breaker for the inverter
- 3. Q03– main supply and the circuit breaker for the

Parameterising the inverter

4. From the start screen in the control system. Swipe left on the display for "Service & Settings", select "Diagnosis Menu", select "Drive Unite Display".



ZETADYN STARTUP-MENU

From user level "Advanced", enter "LCD & Password, change "USR_LEV" from "Advanced" to "Basic"





- Select parameter "f"
- Enter nominal frequency of the motor *See the motors nameplate*
- Select parameter "I"
- Enter nominal current of the motor

See the motors nameplate

ASM_ID : Only asynchronous motors • ASM ID Off

If the nominal speed "RPM" is missing on the motors nameplate, an autotuning can be made after commissioning. See "Special functions /Autotune function" in Ziehl-Abeggs manual

- Select parameter "U"
- Enter nominal voltage of the motor *See the motors nameplate*
- Select parameter "P"

• Enter nominal power of the motor *See the motors nameplate*

Cos phi only for asynchronous motors

Select parameter "Cos phi"

• Enter power factor of the motor See the motors nameplate









Select parameter "SPD_KP"

Multiplication factor to modify the calculated basic amplification SPD_C

NOTE! Before the first run the traveling speed parameters in the control system has to be checked.

From "Basic menu" in NX-T. Swipe left on the screen, select "Settings menu", select "More..", select "Drive Unit", select "Drive velocities", select "Drive velocities V0...V4", select "Velocity V4 (rated)". The rated speed shall not be higher than the selected value "V*" in the inverter.

Check also the value in "Drive velocities VI...VN", that the speed in "Velocity VI (inspection) and "Velocity VR (emergency rescue)" is not more than 300mm/s.

DRIVE FROM THE EMERGENCY RESCUE DEVICE (ERO)

- Select the switch to "Inspektion"
- Push the "COMMON" button as same time as "Up" or "Down"

To overbrige the safty circuit contacts "Overspeed govenor", "Tension weight", "Safty gear" and "Limit switch" press the push button "S55" in the control panel.



NOTE! If the inverter have a brake controller attached :Check that the solinoid for the brakes to the motor have protection (varistors). If not, attach the supplied varistors to protect the rectifier in the breake module (see below).



Varistors (V) attached to parallel connected brakes varistor (V)

ENCODER ADJUSTMENT

If using a brand name other than Ziehl-Abegg SM, an encoder adjustment must be done (synchronous motor only).

Switch the ERO-device to "Inspection".

To do an encoder adjustment the "User level" must be set to "Advanced" in the inverter. If it set to "Basic", select "Start up", select "User level", select "Advanced".





CONNECTION CAN1

To get the best control of the lift the LX118 is always provided with an absolute encoder for positioning the inverter with feedback. This makes it possible to run in "Position mode"

General rules for CAN-bus

• With the power switched off, the resistance between CAN-L and CAN-H should be app. $60\Omega.$ The CAN-bus should be terminated with 120Ω in both ends

• The CAN-wiring should be twisted. Shielded cables can be used in special environment. If shielded cable are usesd, connect the shield to the GND in only one of the ends.

- Stub line to the nodes must be kept below 3m.
- The baudrate on the bus is 250 kbit/s.
- The absolutely encoder is normally provided with an internal 120Ω resistor.
- NX-T, LXC, IO2-CAN, IO8-CAN, FD4-CAN are provided with DIL-switch for termination (120Ω).



TOPOLOGI EXAMPLES



TOPOLOGI EXAMPLE CONT.

Connection: CAN2

Duplex with two lines floor displays or landing panels





CONTROL SYSTEM

LX-T: Screen, menu and operation

TOUCHSCREEN (start screen)

- \downarrow Swipe down: Status for the saftey circuit and the drive command.
- \rightarrow Swipe right: From the edge for sending the lift with car and landing calls
- ← Swipe left: To enter "Service & Settings" menu

• Language: To change the language from "Primary language" to "Alternative language", Tap'n'Hold the screen on the same spot for 3 seconds





LX-T: Screen, menu and operation

THOR NX-T MOUNTED: HORIZONTAL (VERTICALLY) TERMINALS: RIGHT (BOTTOM)



TERMINALS : LEFT (TOP)

Options I/O 6.1– I/O 6.	XJ41 8	-			° ° 11			
X15	x15		19					
Relay output	1	com.	100		-	Q		X25 Sneaker
O3.2= K12	2	3.2	100	≥ ∼ ।)				for car
O3.1= K11	3	3.1		□ • • • • • • • • • • • • • • • • • • •			l õ	
					-	_ .		RJ48 Ethernet
Options I/O 5.1– I/O 5.	XJ42 8	2			8 8			
X16							G	
Relay output	X16		100				Ă	USB1, USB2
O3.4= K14	1	3.4				_`_	ι.	
O3.3= K13	2	3.3	-					MICRO USB
					P			

CONTROL SYSTEM

TERMINALS: TOP (RIGHT)



TERMINALS: BOTTOM (LEFT)



CHECKLIST BEFORE LEARNING TRIP

- Mount the absolute encoder on the car top
- Check the resistance on the bus. It should be about 60Ω between CAN-L and CAN-H on both CAN1 and CAN2. NOTE! Measuer with power off.
 - If $\leq 40\Omega$: More than 2 resistors terminated on the bus.
 - If \geq 120 Ω : Only 1 or none resistor terminated.
- The LED's for CAN1 and CAN2 should be solid green light. X23 (CAN2) och X24 (CAN1)
- The top and bottem floor are correct: "Settings Menu" → "More.." → "Basics" → "Floors" → "Top floor" and "Bottom floor" are correct.
- The saftey circuit is OK. Remove all bypasses that aren't absolutely necessary.
- If plastic coated ropes are used, or another reason to supervise the direction changes, go to: "Service & Assembly" → "Maintenance" → "More.." → "Even more.." "Direction changes counter" → Enter the value in "Pre-Warning" and "Out of order". Also set the values in the inverter "Statistic-menu", see 16.11 in Ziehl-Abeggs manual.
- The car is on the floor level at the bottom floor.

MANUAL LEARNING TRIP OPERATION

- The car is on the floor level on the bottom floor.
- Turn on to Emergency Rescue or Inspection mode.
- "Service & Settings" (Start Screen, Swipe left) → "Service & Assembely" → "Assembling & Repair" → "Learning Trip" → "Simple position encoder" → "Manual Learning Trip".
- "Really erase all existing floor level position and start...." select "Yes".
- Select "OK" if the car is on botton floor. Select "Ok" again.
- Floor "01" and "Position value: 1.000 mm" display, select "Save".
- Floor "02" display. Drive with the Emergency Rescue or Inspection device to floor 2. The new value displays in mm, select "Save". Repeat it up to top floor.
- After the learning trip it displays "The learning trip operation has finished. Please check the car being flush on level at each floor" See section: "Adjust floor level position".

NORMAL OPERATION

AUTOMATIC LEARNING TRIP

- The car is on floor level on bottom floor in normal mode.
- "Service & Settings" (Start Screen, Swipe left) → "Service & Assembly" → "Assembling & Repair" → "Learning Trip" → "Simple position encoder" → "Automatic Learning Trip".
- "Really erase all existing floor level position and start...." select "Yes".
- Select "OK" if the car is on bottom floor. Select "Ok".
- The automatic learning trip operation features the distance...", select "OK".
- The automatic learning trip operation can be used...", select "OK".
- Floor "01" and "Position value: 1.000 mm" display, select "Start".
- The speed during the learning trip is 0,3m/s. It will automatically set the floor levels from the zone vanes. When the lift reach the floor next to the top, the speed decrease to 0.05m/ s until it reach the top floor. The learning trip can be cancelled at any time by selecting "Stop"
- After the learning trip it displays "The learning trip operation has finished. Please check the car being flush on level at each floor" See section: "Adjust floor level position".

ADJUST FLOOR LEVEL POSITION

When the safety circuit works and all bypasses are removed, run the lift to every floor and check the accuracy of flush level:

- "Service & Settings" (Start Screen, Swipe left). Select "Settings Menu" → "More..." →
 "Position Unit" → "Floor Level Positions". Or select "Service & Assembely" → "Assembling & Repair" → "Learning Trip" → "Simple position encoder" → "Floor Level Positions".
- All floor position displays in mm. In order to alter a floor level position Tap'n'Hold a level value. A new dialog to alter the numerical value opens.
- Swipe the digits up and down to change the level position. If the lift was for example stopping 23mm below the flush level, change from 3665 to 3688mm (+23). Select "v".
- After changing all floors, save all values again from the "Flor Level Position Table" by select "v".

SOFTWARE- PARAMETER BACKUP/UPDATE IN ZETADYN 3/ZAdyn 4

From the start screen in the control system. Swipe left on the display for "Service & Settings", select "Diagnosis Menu", select "Drive Unit Display".

To update the software the user level has to be in "advanced mode. From user level "Basic", enter "Start up", change "USR_LEV" from "Basic" to "Advanced"





SOFTWARE- PARAMETER BACKUP/UPDATE, DATE & TIME, SOFTWARE VERSION



Backup/Update parameter:

- Select "Parameter Backup/Update"
- To load a file from USB/SD to the control system, select "Parameter-Set UP-date", select file. To save a file, select "Parameter set Backup", enter the file name. Accept with "V".

Change Date and Time:

• Select "Date & Time". Enter the right value. Select "√"

Verification of Software (software version)

• Select "About & Copyright", and "About & Copyright" again. Version and date displays in the lower left corner. (the version also displays at the start of the control system).

UNBLOCKING THE LIFTCONTROLLER

If the lift controller has entered blocking opertaion mode, because of a supervision function that not allow to let the lift go back to normal operation automatically, you can unblock the lift by the controll system.

Note: To unblock, the safety circuit must be closed.

- After the lift being blocked for interuption in the passive saftey circuit, door supervision, contactor supervison, etc. a red car, a shield and the text "BLOCKED" shows in the start screen.
- Unblock the lift by touching the "Shield" (unblocking icon) or swipe left and select menu "Unblock Lift".
- "Repeal now the blocking operation of the lift?", select "Yes".
- Testing and inspection: After for example an UCM-test, the lift enter blocking operation mode. Unblock the lift by touching the "Shield".
- Inspection drive from the pit: If allowed by local rules, unblock from start screen by touching the "Shield", "Shall the inspection pit operation be finalized", select "Yes".



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SERVICE

STATUS

To view the status for the in- and outputs on the NX-T controller: On the top edge from start screen, swipe downwards.

The safety circuit is shown in the upper right side, and the drive commands in the lower right side

To view the inputs on the NX-T controller, swipe downwards:

To view for example input I4.3 (Shaft pit inspection enable (NC), select "I4" pervision [NC]

"Shaft pit Inspection (NC)" is activated.

To view the outputs on the NX-T controller, swipe downwards:

To view for example output O1.1 (Car at door zone), select "01"

"Car at door zone" is activated.

TERMINALS SETUP

Example: Set input I2.3 to fire alarm.

- From start screen, swipe left "Service & Settings". Select "Terminals"
- Select "On-Board IO-terminals". Select "Inputs". Select 12
- Inputs 2.1–2.4 views (already set inputs are marked). Select "Input 2.3"
- Select "Special function", select "Right Arrow". Select "Fire Alarm". select "Right Arrow", Select Lift "L1". Select "Right Arrow", Select doors "A-D". Select "Right Arrow", Select "All floors". Select "Right Arrow", Select "Inverted". Save with "V" (Ok).

TO SETUP A FUNCTION

Example: Set up a function for Simple Fire Alarm mode.

- From start screen, swipe left "Service & Settings". Select "Settings Menu"
- Select "Controller/Piloting". Select "Fire Alarm"
- "Fire alarm" views, Select "Doors in fire alarm floor". Select "Doors open and close". select "√".
- "Fire alarm" views, Select "Fire Alarm Levels" Enter "Fire Alarm 1" to Tap'n'Hold on the floor. Select the target fire alarms floor. For example "Floor 2" and select doors, for example "A". Save with *9″***√**″ (Ok).











OFF

OFF

OFF OFF OFF



inspection enable [NC]







SERVICE

TROUBLESHOOTING

Safety Circuit: Status



The safety circuit view, showing the current state of the safety circuit inputs.

P= Passive safety circuit

E= Emergency stop

S= Shaft door

A= Car door A

B= Car door B

L= Door lock

The Logbook & Pending Events

When operating a lift application a lot of events may happen that are worth to be recorded. There are basically three categories.





Select "Diagnosis Menu", select "Pending" or "Logbook" Fault and errors; displays in red

Inspection, maintains and warnings; displays in yellow Notification and message; displays in green

PENDING

Shows currently pending events

LOGBOOK

Shows history containing recorded events

Filtering the logbook: To make it easier to find what you are looking for, cross out the categories, by using the filter on top of the dialogue.

For more information about the error, touch the selected line. Select "More..".

("QR-Code" . Each log-book item can be shown as a QR-Code including fingerprint. Use a QR-Code App and scan the code and forward the text as an e-mail for help)

Select "More..", The lifts "Fingerprint" shows. All information about, position, speed, direction, safety circuit etc.



ISOLATION TEST

NOTE! The power supply must be switched off before the isolation test can start!

- 1. Check that the passive and active safety circuit are closed.
- 2. Switch off the main switches Q01, Q02 and Q03. Check that the control panel is not live!
- 3. Switch off all circuit breaker on the control panel!
- 4. Disconnect all plugs (terminals) from the control system (Thor NX-T).

From treminal:	То:	Function:	Value in Mega ohm:	Notes:
X04/1	PE	Supply saftety circuit		
X05/2	PE	Passive saftey circuit		
X05/4	PE	Emergency stop		
X05/6	PE	Doors schaft		
X06/13	PE	Car door A		
X06/14	PE	Car door B		
X05/8	PE	Schaft lock circuit		

Car light Isolation test:

Link terminal XBEL/L together with XBEL/N, or disconnect and twist the conductors in the car cable together. Measure between the linked conductors (XBEL/L and XBL/N) to PE.

From terminal:	То:	Function:	Value in Mega ohm:	Notes:
XBEL/L and XBEL/N	PE	Car light		

After finished isolation test: Restore the control panel!

Signature

Date

TEST PROCEDURE FOR TEST AND INSPECTION: LIMIT SWITCH TEST



Limit switch test

To check that the limit switches work and have right distance bottom and top floor.

- Select "Top-limit-switch testing distance" and "Bottom-limit-switch testing distance" and check that the distance are 100mm below and above the bottom and top floor. The speed for the test is in-spection speed (0,3m/s) and it start to decelerate to the selected target distance. Select "Limit-Switch-testing Assistance"
- "Sure to activete the driveway limit switch....", select "Yes"
- Ensure that people or objects that can get hurt or broken are on top, inside or beneath the car. Confirm with "Yes".
- Select top or bottom limit switch to tap "Bottom \downarrow " or "Top \uparrow "
- Limit switch test to the bottom floor, select "Bottom↓". If the car is not on floor 2 it start first to floor 2. Select "Start".
- The lift starts with inspection speed to the target position (100mm) below the floor level.
- The result of the limit switch test operation, including the reached velocity and the distance to the end floor displays. If the limit switch is activated (broken), the lift gets in blocking mode. To unblock the lift, tap on the "Shield" or go to the icone "Unblock Lift", and select "Yes".
- Use the Emergency Rescue Device and push the button "S55" (on the control panel) to move the car up or down.
- Limit switch test to the top floor: Select "Top \uparrow ". Otherwise the same procedure as above.

Result: (mm)

Abov top level	
Below bottom level	

Signature

Date



TEST PROCEDURE FOR TEST AND INSPECTIONG: UCM-test





UCM-test:

Closed door:

Drive the lift to some floor level.

- Select "UCM-Testing Door Operation", select "Open doors physically for UCM-testing operation", select "
 √" (ok).
- Select "UCM-Testing Assistant"".
- "Sure to activate the UCM-testing assistant? This will turn the lift to "out of order.", select "Yes"
- Make sure that the car is flush at floor level. Select "Yes".
- To continue the UCM-test, disconect the door circuit (X05/5 and X05/6) it must be broken.
- Select the direction of the test by swiping the floor value on the left side. Select "Start". You can stop the testing anytime by tap "Stop"
- The lift will start and then stop. The testing results and a note that the lift are in blocking mode shows, select "OK"
- "Unblock lift"

Open door:

Drive the lift to some floor level

- Select "Open doors physically for UCM-Testing Operation". Select "**v**" (ok).
- Select "UCM-Testing Assistant"".
- "Sure to activate the UCM-testing assistant? This will turn the lift to "out of order...", select "Yes"
- Make sure that the car is flush at floor level. Select "Yes".
- Check that the door circuit (X05/5 och X05/6) are broken.
- Select the direction of the test by swiping the floor value on the left side. Select "Start". You can stop the testing anytime by tap "Stop"
- The lift will start and then stop. The testing results and a note that the lift are in blocking modeshows, select "OK"
- "Unblock lift"

DECLARATION OF CONFORMITY LX118 NX-T THOR

Company: Hisselektronik Sweden AB

Product model: Liftcontroller LX118 / NX-T THOR

The product is developed, designed and manufactured in accordance with the EMC directives 2004/108/EEC. The following harmonized standards are in use:

EN 12015	Electron and a second state of the second stat	
EN 12015	Electromagnetic compability – product family standard for lifts - Emission	EN 12015:2004
	Conducted disturbance	EN 12015:2004
	Radiated disturbance	EN12015:2004
	Harmonics	EN61000-3-2:2006
EN 12016	Electromagnetic compability – Product family standard for lift - Immunity	EN 12016:2004-A1:2008
	Electrostatic discharge (ESD)	EN 61000-4-2:1995-A1:1998, - A2:2001
	Radio-frequency electromagnetic field	EN 61000-4-3:1997
	Fast transient	EN 61000-4-4:2004
	Surges	EN 61000-4-5:2006
	Induced radio frequency field	EN 61000-4-6:1996
	Voltage dips and interruptions	EN61000-4-11:2004

Environmental test is done on NX-T THOR CPU with severities according to EN 81-50, point 5.6.3.1.2, point 5.6.3.1.3.2, point 5.6.3.1.3.3 and point 5.6.3.2

EN 81-50	sinusoidal vibration	IEC 60068-2-6:2007
	shock	IEC 60068-2-27:2008
	dry heat	IEC 60068-2-2:2007
	cold	IEC 60068-2-1:2007

The complete technical documentation is available. The compliance with the directive depends on the correct installation of the product. The installation instruction from the manual has to be followed.

Tyresö 2017-09-04

Hisselektronik Sweden AB

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LIFTINSTITUUT



EU-TYPE EXAMINATION CERTIFICATE

Issued by Liftinstituut B.V. identification number Notified Body 0400, commissioned by Decree no. 2016-0000038870 Certificate no. : NL17-400-1002-186-02 Revision no.: -Description of the product Lift control unit for electric or hydraulic lifts with monitoring circuit for safety chain and door bridging circuit, also applied for detection of uncontrolled movement of the car (UCMP) : Safeline Sweden AB, THOR NX-T, SB and SZ board Trademark, type Name and address of the SafeLine Sweden AB manufacturer Antennvägen 10 SE135 48, Tyresö, Sweden Name and address of the : SafeLine Sweden AB certificate holder Antennvägen 10 SE135 48, Tyresö, Sweden Certificate issued on the Lifts Directive 2014/33/EU following requirements Certificate based on the : EN 81-20:2014, clause 5.11.1 and 5.11.2.3 following standard EN 81-50:2014, clause 5.15 **Test laboratory** Date and number of the 1 a laboratory report Date of EU-type examination : November 2015 - February 2017 Additional document with this : Report belonging to the EU type-examination certificate certificate no.:NL17-400-1002-186-02 Additional remarks : The printed circuit boards are not subjected to the laboratory tests according to clause 5.6 of EN 81-50. Key parameters for detecting UCM Detection distance : installed door-zone (variable) Max. response time THOR NX-T: 22ms Speed and distance travelled : to be calculated Conclusion The safety component meets the requirements of the Lifts Directive 2014/33/EU taking into account any additional remarks mentioned above. Amsterdam ing. J.L. van Vliet Date : 16-02-2017 Certification decision by

Valid until : 16-02-2022

Managing Director





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